

<b>CH2M HILL Hanford Group, Inc.</b>	<b>Manual</b>	<b>Management Plan</b>
<b>TANK FARM CONTRACTOR</b>	<b>Document</b>	<b>TFC-PLN-43, REV A-11</b>
<b>HEALTH AND SAFETY PLAN</b>	<b>Page</b>	<b>1 of 23</b>
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[Ownership matrix](#)

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## 1.0 PURPOSE AND SCOPE

This Tank Farm Contractor (TFC) Health and Safety Plan (HASP) identifies health and safety risks to workers and other on-site personnel and ensures the safe conduct of all operations and other work activities at the 200 Area tank farms. The HASP accomplishes this objective by identifying hazards, providing general guidelines, and providing reference to procedural and task-specific controls and requirements. The HASP, in conjunction with the job-specific information, is a reference for use during the planning of work activities at the tank farms. It also provides the documentation needed to comply with OSHA regulations at [29 CFR 1910.120](#), [DOE O 440.1A](#), and the requirements of the U.S. Department of Energy (DOE) Voluntary Protection Program (VPP). It was prepared to be consistent with the NIOSH/OSHA/USCG/EPA Publication. The HASP is an umbrella document which provides links to numerous other policies, plans, and procedures of the TFC governing safety and health of personnel at the Hanford tank farms. (15.1.1, 15.1.2, 15.1.5)

The HASP is organized according to subject matter and presents general information relevant for the planning and conduct of work at all tank farms and associated facilities. This information establishes baseline health and safety guidelines. Facility-specific information is provided in [RPP-13033](#).

This HASP applies to CH2M HILL, other prime contractors to the DOE, and subcontractors to CH2M HILL who may be involved in tank farm work activities such as design, construction, operation, maintenance, decontamination, decommissioning, and environmental restoration activities. The plan is intended to be a useful reference to aid tank farm workers in understanding the safety and health issues that are encountered in routine and non-routine work activities.

## 2.0 INTRODUCTION

There are 149 single-shell storage tanks and 28 double-shell storage tanks at the tank farms. The waste contained in the single-shell tanks and double-shell tanks consists of highly radioactive, heat-producing, and chemically toxic wastes that are the result of processing spent reactor fuel from the nuclear weapons program. The unique characteristics of the waste create the potential for the generation of flammable gases and/or toxic vapors that can be detrimental to the safety and health of workers. As a result of the nature of the waste and activities at the tank farms, workers may be exposed to a number of occupational hazards (e.g., work in confined spaces, heavy equipment, electrical, toxic chemicals, radiological, heat stress and other physical agents, biological agents, and ergonomic risks), some of which are typical of any large industrial facility where a significant percentage of the work is performed outdoors. Other hazards are unique to the work environment of the tank farms.

### 2.1 Description of Tank Farm Activities

The tank farms mission is to perform operations to maintain safe storage of waste (i.e., ensure that the public, on-site worker, and facility worker are protected from unplanned releases of radioactive and hazardous materials), support consolidation of waste for future treatment, implement processes to treat and stabilize the waste, and ensure that environmental insult from these activities and operations do not occur. Tank farm activities include waste transfer, waste storage, waste characterization, waste concentration, interim stabilization, activities at miscellaneous tank farm facilities, equipment installation or removal, waste surveillance activities, and core drilling and waste sampling. These activities and operations are described in

[RPP-13033](#), Section 2.5. Routine activities that support tank farm operations are listed in [RPP-13033](#), Table 2.5-1.

Field work is planned and performed using teams composed of operations, maintenance, health physics, engineering, quality, and safety personnel. These teams are responsible for work package planning and preparation; completion of corrective maintenance, surveillance, and calibration field activities; and providing support to project, construction, and characterization activities.

Tank farm activities are to be conducted within the bounds of this HASP and current occupational and nuclear safety documentation and in compliance with applicable federal, state, and local regulations, as mandated through the approved Tank Farm Contractor Standards/Requirements Identification Document ([HNF-SD-MP-SRID-001](#)).

## 2.2 Tank Farm Work Control

The tank farm work control process utilizes the Integrated Environment, Safety, and Health Management System (ISMS) to conduct work activities safely, as described in RPP-MP-003. The work control process requires interaction among organizations and personnel who schedule, plan, approve, release, and perform the work.

The tank farm work control process is detailed in [TFC-OPS-MAINT-C-01](#). This procedure defines work control from initiation of a work request through post-job work review and closeout, specifies when formally written work instructions are required, and specifies the degree of planning required.

## 3.0 ROLES AND RESPONSIBILITIES

Organizational roles, responsibilities, and interfaces are described in CH2M HILL charters, program plans, and implementing procedures. Specific individual responsibilities are described in position descriptions. The complete CH2M HILL organizational structure and supporting policies and programs may be found on the CH2M HILL web page at <http://apweb200.rl.gov/rapidweb/chg/rpp/>. An overview of responsibilities for organizations and personnel key to worker safety and health is provided in the following sections.

### 3.1 Tank Farm Management

Tank farm management is responsible for ensuring work is properly prioritized, planned, and executed in a safe manner. In addition, tank farm management ensures that the tank farm staff possesses the skills and resources necessary to safely conduct their assigned tasks.

### 3.2 Tank Farm Employees

Tank farm employees are responsible for ensuring work is conducted in a safe and healthful manner and that safety and health concerns are reported and understood. Employees are responsible for following written procedures, controls specified in permits, and additional safety instructions contained in work control documents or conveyed by the field work supervisor. Employees must report unsafe conditions or practices to their manager or field work supervisor during work performance and, when appropriate, should take personal action to correct or mitigate the unsafe condition at the time it is discovered. Employees have the authority and should stop work if an immediate threat to life or health exists, or exercise a work clarification

pause to temporarily suspend work activities where an error, omission, or other issue has the potential to adversely affect safety, quality, or the environment, but does not represent an imminent danger. The process for exercising stop work authority or a work clarification pause is identified in [TFC-POL-32](#).

### 3.3 Safety Management

The Safety Program organization provides company-wide policies, programs, activities, support personnel, and oversight in the areas of safety, radiological control, and environmental health. The Safety Program organization manages the company-wide VPP and ISMS. Support organizations for [Waste FeedBase Operations](#) and [Closure Project Retrieval and Closure Operations](#) supply qualified personnel and systems to implement company ES&H expectations and requirements.

The Safety and Health Program provides interpretive authorities for industrial safety, industrial hygiene, occupational medicine, fire protection, and case management. Other responsibilities include developing and implementing this HASP; auditing field activities, as appropriate, to verify compliance; providing effective integration and involvement of safety and health professionals in daily tank farm activities to ensure hazards are identified and controlled; supporting the line organization in dealing with hazards; and establishing safety and health requirements to comply with the TFC S/RID. [TFC-PLN-47](#) describes the Safety and Health Program and the VPP.

### 3.4 Safety Personnel

Personnel in the Safety and Health organization are responsible for assisting tank farm management in defining and resolving safety and health issues, aiding in the communication of hazards to tank farm employees, providing evaluations of hazards, verifying compliance with this HASP, and assisting TFC personnel to ensure that all designated health and safety procedures and requirements are properly implemented in the field.

### 3.5 Radiological Control

The Radiological Control Program department is responsible for the company-wide Radiological Control program, including: policies, procedures, standards, technical support, field support, and oversight of radiological activities; Radiological Control safety-related performance measures and indicators; radiation protection program for 10 CFR 835 compliance; ionizing radiation dosimetry and instrumentation services; "As Low as Reasonably Achievable" (ALARA) program and reporting; technical basis development and maintenance for radiological control; and primary radiological control technical interface with the DOE, ORP.

## 4.0 HAZARDS PREVENTION AND CONTROL

The tank farms pose potential physical, chemical, environmental, and radiological hazards; and personnel may be exposed to a variety of chemical, physical, biological, and ergonomic agents while working at the tank farms.

Worker exposure to hazards may result from contact with materials, use of equipment, or working conditions. The radiological and chemical hazards associated with the tank farms have been documented extensively. Multiple other hazards that must be considered include vapor exposures; flammability; heat and cold stress; electrical hazards; excessive noise levels;

encounters with snakes, spiders, and insects; poor lifting techniques; and slips, trips, and falls. These hazards must be identified, and personnel must be properly protected. The goal of identification of risks and appropriate protection of workers is to reduce the risks of injury and property damage, and reduce exposure to chemical or radioactive materials to ALARA.

Tank farm personnel and Safety and Health staff work together to identify hazards at the work location. As hazards are identified and evaluated, controls are implemented to eliminate or mitigate the potential risks. The measures employed are documented, and the documentation is then disseminated. This information on hazards is used for work location posting and for discussion at pre-job safety briefings and safety meetings.

The following subsections provide information on specific safety and health hazards that may be present at tank farms.

#### **4.1 Fire and Explosion Hazards and Controls**

Potential fire and explosion hazards exist at the tank farms. Fire and hazards may be present during activities such as introducing an ignition source into an explosive or flammable environment; welding, cutting, and burning; or using flammable/combustible materials.

##### **4.1.1 Flammable Gas**

Flammable gases, primarily hydrogen, are generated by tank waste. If the concentration of a flammable gas mixture reaches its lower flammability limit (LFL) and an ignition source is present, a deflagration or detonation can occur with sufficient energy to release radioactive and other hazardous materials to the environment. A flammable gas hazard potentially exists at all tank farm facilities where waste is present. These include double-shell tanks, single-shell tanks, double-contained receiver tanks, catch tanks, inactive miscellaneous underground storage tanks, the 244-AR and 244-CR vaults, the 242-S and 242-T evaporators, and other miscellaneous facilities. Additionally, a flammable gas hazard potentially exists within waste-intruding equipment and waste transfer systems. Flammable gas hazards are analyzed in [RPP-13033](#).

There are two mechanisms by which waste-generated flammable gases can reach high concentrations in tank farm facilities. First, flammable gases generated by the waste are continuously released into vapor spaces. In the absence of adequate ventilation, the steady-state concentration of these gases can potentially exceed the lower flammability limit. Second, a fraction of the gas generated by the waste can be retained within the waste. This retained gas can be released in a spontaneous or induced gas release event (GRE), thereby increasing the flammable gas concentration in a tank headspace to above the lower flammability limit.

Administrative Control (AC) 5.10, "Flammable Gas Controls," in conjunction with Limiting Condition for Operation (LCO) 3.2.1, "DST Primary Tank Ventilation;" LCO 3.2.2, "SST Passive Ventilation Systems;" AC 5.11, "Transfer Controls;" AC 5.7, "Safety Management Programs;" and AC 5.8, "Emergency Preparedness;" reduces the risk of radiological and toxicological material being released from tank farm facilities by reducing the frequency of flammable gas accidents. Specifically, AC 5.10 establishes ventilation and process control requirements that function to maintain flammable gas concentrations below the lower flammability limit, monitoring requirements to verify that concentrations are below the lower flammability limit, and ignition controls to reduce the probability of ignition should the lower flammability limit be exceeded. AC 5.10 also protects flammable gas analysis assumptions. These controls are described in [RPP-13033](#), [HNF-SD-WM-TSR-006](#), and [HNF-IP-1266](#).

#### **4.1.2 Cutting, Welding, and Burning**

Hazards from cutting and welding with electric arcs, oxy-fuel gas flames, and other forms of hot work (such as open flames, grinding, and brazing processes) include extreme heat, sparks, hot slag, fumes, gases, noise, and shock. [TFC-ESHQ-FP-C-01](#) provides the requirements and responsibilities for the control of these hazards.

#### **4.1.3 Flammable/Combustible Material**

Flammable liquids are stored and dispensed from U.S. Department of Transportation (DOT)-approved shipping containers or approved safety containers. The vapors given off from these liquids are above their flash point and therefore are susceptible to any ignition source. [TFC-ESHQ-FP-STD-03](#) provides the requirements for the use, storage, and handling of these liquids.

Flammable gases are stored at high pressures in DOT-approved shipping containers, which provide protection. Failure of such a container will release very large volumes of gas; therefore, expert attention is needed in handling, transporting, and using these materials. [TFC-ESHQ-S-STD-25](#) provides the requirements for the storage, transportation, identification, and use of compressed gases.

### **4.2 Chemical Hazards and Controls**

Chemical agents to which personnel can potentially be exposed include the tank waste, chemical vapors, and chemicals used to support tank farm operations such as caustics for pH control and support chemicals (e.g., cleaning agents, solvents, lubricants, paints, adhesives, welding rods).

- Exposure to hazardous chemicals in the tank farms can be by any of the possible routes:
- Inhalation of hazardous materials may occur from lack of, failure of, or improper use of engineering controls, administrative controls, or respiratory protection equipment.
- Absorption through the skin can occur by direct contact, especially through cuts and/or abrasions. Skin or eye absorption can occur when a worker does not wear the proper protective clothing or proper eye protection, when a break or a tear occurs in the protective clothing, or when contaminated objects come in contact with the eyes.
- Exposure by ingestion generally occurs when good personal hygiene practices are not followed. An example is not washing hands adequately after potential exposure and before smoking, eating, drinking, or chewing gum or tobacco.
- Hazardous substances may be injected into the body through wounds inflicted by contaminated equipment.

#### **4.2.1 Tank Waste**

Tank waste is a mixture of organic and inorganic chemicals and radionuclides kept at an elevated pH to retard corrosion of the tank linings, so tank waste is presumed to be very corrosive to the skin. Tank waste is handled as a no-contact material, primarily under engineering controls. Under certain circumstances, when engineering controls cannot be considered completely reliable, personal protective equipment will be required by job procedures as secondary

protection from exposure. If an incident involves contact with skin or clothing, the persons involved are trained to immediately decontaminate using a safety shower, eyewash station, decontamination trailer, or any combination of these facilities.

#### **4.2.2 Tank Waste Vapors**

Personnel in the tank farms are potentially exposed to vapors emanating from the tank breathers, fugitive leaks, and deliberate breaks in containment. These vapors contain a mixture of chemical compounds that can escape containment because of chemical reactions in the tank, activities that disturb the tank contents and allow gasses to escape, displacement by changes in the volume of solids and liquids in the tanks, or by barometric pressure changes.

The chemicals of greatest industrial hygiene concern are those which can escape the tanks in concentrations greater than the applicable occupational exposure limit and those which can cause irreversible health effects. The specific chemicals designated as of greatest industrial hygiene concern are detailed in the Industrial Hygiene Technical Basis, [RPP-22491](#). The technical basis is updated on a regular basis with the most recent sample results. The As Low As Reasonably Achievable (ALARA) concept will be used in regards to personnel exposure to tank vapors. The details of the ALARA approach to vapor control are found in the Industrial Hygiene Exposure Assessment Strategy, [TFC-PLN-34](#). The EAS contains details on Industrial Hygiene Administrative Control Levels, Action Levels, and Occupational Exposure Levels.

Control of tank farm vapors to ALARA is by means of the hierarchy of controls.

1. Engineering controls on tank vapors include:
  - HEPA filters on all tank vents to contain particulates
  - Positively ventilating some tanks, keeping the headspace under negative pressure, and discharging the exhaust at a safe location
  - Putting passively ventilated tanks, with the headspaces at atmospheric pressure, under positive ventilation during breach of containment and/or waste-disturbing activities
  - Equipping some passively ventilated tanks with stacks heights tall enough to discharge vapors at an elevation well above the breathing zone of tank farm personnel
  - Maintaining the sealing of fugitive leak sources
  - Purging confined spaces such as equipment cabinets connected to tank headspaces before opening/entering.
2. Administrative controls include:
  - Tank farm entry access controls

- Vapor control areas, known as Vapor Control Zones, established around known sources of vapor release into the environment so that unprotected personnel are kept out of these areas. [TFC-ESHQ-S-IH-CD-35](#)~~TFC-ESHQ-S-IH-C-48~~ provides details on how Vapor Control Zones are established and managed. This procedure also provides specific information on administrative and personal protective equipment controls around tank waste vapor emission sources. [TF-AOP-015](#) identifies the actions required for response to notification from personnel that vapor odors are present.
3. Personal protective equipment includes use of respiratory protection approved by Industrial Hygiene, either as specified in job procedures, Tank Vapor Information Sheets, or job hazard analyses or through voluntary use even though not required for compliance with the occupational exposure limit. The procedure for mandatory and voluntary use of respiratory protection is described in [TFC-ESHQ-S-IH-C-05](#).

#### 4.2.3 Tank Farm Support Chemicals

Personnel may be exposed to a wide variety of chemicals (e.g., oxidizers, flammable and combustible chemicals, unstable chemicals, acids, and caustics) used in support of tank farm maintenance, operations, and construction activities. [TFC-ESHQ-S-STD-20](#) establishes the chemical management system for the acquisition, storage, use, transportation, and final disposition of chemicals in a safe manner. [TFC-ESHQ-S-STD-20](#) provides requirements for complying with safe storage and handling of hazardous chemicals and chemical products. Minimum requirements for eyewash and shower equipment for the emergency treatment of the eyes and the body of a person who has been exposed to injurious materials are identified in [TFC-ESHQ-S-STD-19](#).

### 4.3 Physical Hazards and Controls

#### 4.3.1 Cold Stress

Working in cold environments puts stress on workers. The body works best at and tries to maintain a set internal temperature of approximately 99-100°F. When the body temperature decreases much below this setpoint, the body's temperature regulation system acts to conserve heat and generate new heat. This physical strain, combined with other stresses such as allergies, vascular disease, excessive smoking and drinking, some medications, age, and general health condition, may lead to cold disorders, disabilities, or even death. TFC-ESHQ-IH-STD-01 (under development) provides information on the recognition and treatment of cold disorders, ways of predicting cold disorder potential, and preventing cold stress.

#### 4.3.2 Heat Stress

Work areas with high temperature/humidity, sources of significant radiant heat, or requiring the use of protective clothing that impedes sweat evaporation can create the potential for heat stress. When the body's cooling system has to work too hard to reduce heat stress, it can strain itself. This physical strain, combined with other stresses, such as work, loss of fluids, or fatigue, may lead to heat disorders, disabilities, or even death. The requirements to identify, evaluate, and control worker heat stress in both indoor and outdoor work environments are identified in [TFC-ESHQ-S-IH-C-07](#).

#### 4.3.3 Noise Hazards

Tank farm work activities may result in employee exposure to continuous, intermittent, impulsive, and impact noise at or above 85 dBA eight-hour time-weighted average, or equivalent noise dose. The processes for identification and control of noise hazards, and the criteria for employee enrollment into the hearing conservation program, are identified in [TFC-ESHQ-IH-STD-06](#).

#### 4.3.4 Illumination

Tank farm personnel may encounter areas in the tank farms with inadequate lighting levels. When there is concern regarding inadequate lighting, an illumination survey can be performed and improvements made to allow safe conduct of work activities. Such improvements may include the location and use of portable lighting, dependent on the job-specific needs. (15.1.3, 15.1.4)

#### 4.4 Radiological Hazards and Controls

The primary occupational radiological hazards that may be encountered in tank farm facilities consist of direct radiation exposure hazards, external contamination hazards, and potential uptakes of radioactive materials through inhalation, ingestion, injection, or skin absorption. The types of radioactive materials that may be encountered consist of a wide range of fission products, transuranic radionuclides, and neutron activated materials. The types of radiation that may be encountered include exposure to alpha and beta particles, gamma and x-rays, and neutrons. Potential exposure pathways for the workers and the public include direct exposure to external ionizing radiation, contamination, inhalation, and ingestion of radionuclides and subsequent internal exposure. Radiological work, including access control, monitoring, and exposure reporting, is conducted in accordance with [HNF-5183](#) and [HNF-MP-5184](#).

#### 4.5 Ergonomic Hazards and Controls

Common ergonomic hazards identified at the tank farms include the use of backpack mounted self-contained breathing apparatus and manual lifting of tools, equipment, or materials necessary to perform work tasks. In addition, office environments can present ergonomic hazards. [TFC-ESHQ-S IH-STD-03](#) establishes requirements to ensure that conditions presenting potential ergonomic-related hazards to employees are identified and controlled. Guidance for preventing injuries from common office safety hazards is provided in [TFC-ESHQ-S-STD-11](#).

#### 4.6 Biological Hazards and Controls

Snakes, scorpions, bees, and spiders may hide under or inside of equipment, or in protective clothing storage areas. Workers disturbing them may be bitten or stung. The consequences of a bite or sting can be a severe reaction and, possibly, death. Prompt medical aid must be provided if an injury from a biological hazard occurs. Workers with known extreme reactions to bee stings should consider carrying an anaphylaxis emergency treatment kit and inform coworkers and supervisors of their condition. Workers are advised to shake out all protective clothing before donning.

Biological hazards also are present for employees potentially exposed to blood borne pathogens. Employees who, in the course of their work, may come into contact with blood or other potentially infectious materials must follow the requirements of [TFC-ESHQ-S-STD-24](#).

#### **4.7 Work Environment Hazards and Controls**

Hazards discussed in this section may be encountered in routine job activities performed in the tank farms. The following subsections reflect items for consideration during planning of tank farm work activities.

##### **4.7.1 Aerial Lifts**

All requirements and responsibilities for the construction, inspection, maintenance, and operation of vehicle-mounted, boom-supported, and self-propelled elevating work platforms or aerial lifts must be met through compliance with [TFC-ESHQ-S-STD-12](#).

##### **4.7.2 Asbestos**

Asbestos-containing materials are found throughout the tank farms in thermal insulation, building materials, above ground piping, floor tiles, siding, roofing, cement asbestos boards, and gasket material. When activities involve working on or disturbing asbestos-containing material, controls, as stated in [TFC-ESHQ-IH-STD-04](#) and [TFC-ESHQ-IH-STD-05](#) must be used and followed.

Asbestos-containing material might present an inhalation hazard if it becomes damaged and friable. Chronic (long-term) exposure can cause lung cancer, mesothelioma, digestive system cancer, and asbestosis. These risks are minimal when material is not disturbed.

Facilities with asbestos-containing material have postings at each entrance and known asbestos-containing material are identified using asbestos-containing material labels or pink coating. Only Washington State certified asbestos workers may handle asbestos.

##### **4.7.3 Beryllium**

Traces of beryllium may still be found in a few isolated locations, but it is no longer used in the tank farms. The known areas where beryllium was present have been decontaminated, but there remains a low probability that additional traces of the metal may be identified from time to time, mainly from the prior use of tools containing beryllium. The Chronic Beryllium Disease Prevention Program is described in [TFC-PLN-24](#).

##### **4.7.4 Confined Space**

There are numerous confined spaces in and around the tank farm facilities. These include, but are not limited to, storage tanks, valve pits, pump pits, underground vaults, and caissons. Entry into the confined space is not allowed until a hazard evaluation is performed, the space is classified, and the potential entries are posted. The process used to label confined spaces and perform confined space entry is identified in [TFC-ESHQ-S IH-C-04](#).

##### **4.7.5 Electrical Hazards**

Overhead power lines, downed electrical wires, and buried cables all pose the danger of shock or electrocution. Electrical equipment may also pose a hazard to workers. Careful observation for overhead electrical hazards must be performed by operating personnel before raising masts on drill rigs, booms on cranes, or when operating any equipment capable of coming into contact with electrical wires. Before drilling or digging is performed in the tank farms, whether by hand or

mechanical means, safe clearances must be determined. Workers must also look for frayed cables, uncovered openings in boxes and switch centers, and any other defects in electrical equipment. These hazards must be reported to the manager/field work supervisor as soon as they are observed.

Temporary electrical power and lighting installations are not permitted except during periods of construction, remodeling, maintenance, repair, or demolition of buildings, structures and equipment, or for experimental or developmental work.

[TFC-ESHQ-S-STD-03](#) is the foundation for the electrical safety program and describes the standards for electrical safety training, electrical equipment requirements, installation/modification requirements, and electrical safe work practices.

#### 4.7.6 Elevated Work Areas

During the course of work in the tank farms, personnel may be required to work in elevated positions on scaffolds, ladders, or equipment. When such work must be performed, a fall protection plan or other documentation containing necessary worker protection controls must be developed and followed. The process for identifying, prescribing, and maintaining fall protection is described in [TFC-ESHQ-S-STD-26](#). The requirements for use of scaffolding are identified in [TFC-ESHQ-S IS-C-01](#). [TFC-ESHQ-S-STD-01](#) establishes requirements to ensure proper selection, inspection, and use of portable ladders.

#### 4.7.7 Excavation, Trenching, and Shoring

Excavations include any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal. [TFC-ESHQ-S IS-C-03](#) prescribes the minimum safe work practices for protecting personnel working in and around excavations.

#### 4.7.8 Fall Hazards

Good housekeeping prevents many fall hazards, and all work areas should be free of all fall hazards to the extent possible. When it is not possible to secure the work area of fall hazards, the hazards have to be identified and reported to the field work supervisor or facility representative. When work activities take place within six horizontal feet of a fall hazard that is six feet above another work surface, or when employees work over any operating machinery, open spaces, or hazardous substances, [TFC-ESHQ-S-STD-26](#) must be followed.

#### 4.7.9 Falling Objects

During tank farm operations and maintenance elevated work activities, it is important to remember there is a potential for objects to fall. For workers requiring access to areas where falling objects are possible, hard hats are required per [TFC-ESHQ-S IS-C-02](#).

#### 4.7.10 Hand and Portable Power Tools

Tank farm employees who operate power tools must be properly trained in the use of the equipment. Power tools should be operated in strict accordance with the manufacturer's instructions. Required PPE must be worn as needed when operating power tools. The requirements and responsibilities for the use of power tools are located in [TFC-ESHQ-S-STD-13](#).

#### 4.7.11 Heavy Equipment

All heavy equipment operators must obey all posted signs and Washington State vehicle laws. Heavy equipment must be used in accordance with manufacturer's instruction for use. Guidelines for transportation are provided in [TFC-ESHQ-S-STD-02](#).

#### 4.7.12 Lead

Lead may be found in paints, shielding materials, bulk metals, solders, alloys, nails for metal roofs, mortars, glass, piping systems, metal seams and joints, laboratory and process chemicals, various equipment and building components, waste materials, and contaminated environmental media, as well as in other materials. The program for protection of personnel from exposure to lead is described in [TFC-ESHQ-IH-STD-08](#).

#### 4.7.13 Machine Guarding

A variety of electric motors, pumps, and other power-driven equipment is found or used in the tank farms. Although all machinery should be equipped with appropriate machine guarding, instances may occur when workers in the tank farm area might be exposed to unguarded drive shafts and couplers; chains and sprockets; v-belts and pulleys; and reciprocating parts, pinch points, or unexpected startups. Workers must be aware of these potential hazards and report them when observed so they may be properly guarded. Requirements for machine guarding are identified in [TFC-ESHQ-S-STD-21](#).

#### 4.7.14 Natural Hazards

Potential natural phenomena hazards include earthquakes, range fires, high winds/dust storms, flooding, volcanic ash fall, snow fall, and lightning. Actions to be taken in response to a natural hazard event are identified in abnormal operating procedures [TF-AOP-004](#), [TF-AOP-007](#), [TF-AOP-008](#), [TF-AOP-010](#), [TF-AOP-013](#), and [TF-AOP-014](#).

#### 4.7.15 Overhead Objects

Some work activities require passage beneath low hanging structures such as piping or conduit. Any repeated work activities requiring passage beneath low hanging structures requires the use of hard hats. If overhead obstructions are in areas where it is not feasible to reroute personnel, the obstructions must be marked with caution tape or signs. General guidance can be found in [TFC-ESHQ-S-IS-C-02](#).

#### 4.7.16 Pinch Points

During certain work activities in the tank farms, situations may arise where workers are exposed to moving machinery injury hazards. This situation may present a "pinch-point hazard." Pinch-point injury hazards can exist between unguarded rotating and fixed parts that create a shearing, crushing, or abrading action. Guidance for preventing pinch-point injuries is provided in [TFC-ESHQ-S-STD-21](#).

#### 4.7.17 Rigging Operation

Operation, inspection, maintenance, and repair requirements for cranes, hoists, fork trucks, and rigging equipment can be found in DOE/RL-92-36. Safe handling and moving of material by motorized crane, hoist, or rigging is guided by TFC-ENG-FACSUP-C-25 and moving of material by powered industrial truck is guided by [TFC-ESHQ-S IS-C-07](#).

#### 4.7.18 Roof Work

At various times in work activities at the tank farm supporting facilities, it is required that workers access and work on the roof of a facility. When it is necessary for these activities to occur, an inspection/evaluation of the roof must be performed in accordance with [TFC-ESHQ-S-STD-12](#). If potential weak spots not previously identified are discovered during conduct of work, the work must be postponed to address the new hazards, and the problem must be reported to the building administrator. The load limits of the roof must be determined and/or known before a load is placed on the roof. When working closer than six horizontal feet to a roof's edge, [TFC-ESHQ-S-STD-26](#) must be followed.

#### 4.7.19 Sanitation/Housekeeping

All work places must be kept clean and housekeeping monitored regularly. At the end of each task, the work area will be clean with all work materials, tools, and equipment returned to appropriate storage locations.

#### 4.7.20 Sharp Objects

Certain work activities in tank farms may expose workers to hazards involving sharp object injuries. Sharp objects can be encountered as a result of mechanical failure in the course of using tools and machinery, and in handling discarded waste materials. Guidance in preventing injuries due to sharp objects is provided in site procedures and the applicable Job Hazard Analysis.

#### 4.7.21 Stored Energy Sources/Lock and Tag

Stored energy sources pose a potential hazard to tank farm workers. These hazards include, but are not limited to, electrical, mechanical, hydraulic, pneumatic, chemical, radiation and thermal energies, and various forms of potential energy (e.g., springs, compressed gases, or suspended objects). Lockouts/tagouts must be used to protect workers from these energy sources. The lockout/tagout procedures are described in [TFC-OPS-OPER-C-05](#).

#### 4.7.22 Vehicle Traffic

All vehicle drivers in tank farms must obey all posted signs and Washington State vehicle laws. Guidelines for transportation are provided in [TFC-ESHQ-S-STD-02](#). Vehicles are not allowed in the tank farms unless the job requires the use of a vehicle. Vehicle movement in the tank farms is allowed under [TFC-OPS-OPER-C-10](#). Vehicle fuel systems must be protected and approved by Operations in accordance with [HNF-IP-1266](#) prior to entry into the farms. Pedestrians in the tank farms must be aware of all vehicle traffic and obey all safety rules.

#### 4.7.23 Walking/Working Surfaces

Walking/working surfaces in the tank farms present slip, trip, and fall hazards. This hazard has a high potential for causing harm to employees. Hazards that may exist include uneven terrain, guy wires, stairs, ramps, wind-blown soil, rocks, risers, conduit, ducts, well caps, electrical cords, and hoses. Additional risks from walking/working surface hazards are present during inclement weather or during the evening when lighting in the tank farms is minimal. The requirements for providing safe walking and working surfaces to prevent injuries from slips, trips, and falls are described in [TFC-ESHQ-S-STD-05](#).

#### 4.7.24 Working in Proximity to Moving Vehicles/Equipment

A variety of equipment may be used in the tank farms, including cranes, backhoes, personnel lifts, sample trucks, pickup trucks, and other vehicles. Workers must pay close attention when working in areas where vehicles are operated and use appropriate personal protective equipment as specified in job procedures or job hazard analyses. Spotters and/or signal persons must be used whenever there is a potential hazard from the movement or operation of machine or vehicle in accordance with the DOE/RL-92-36 and [TFC-ESHQ-S-STD-02](#).

### 5.0 SITE/ACCESS CONTROL

The purpose of site control is to minimize the potential exposure of hazards to workers, protect the public from hazards, and prevent unauthorized entry. Site boundary controls are established to limit access to areas of hazard concerns. Tank farm access control requirements are described in [TFC-OPS-OPER-C-04](#).

#### 5.1 Radiological Control Areas

Contamination/airborne radioactivity control areas and radiation areas are established in accordance with [HNF-5183](#). An access control entry system is used to control access to the tank farm radiological areas in accordance with [HNF-5183](#) and [HNF-MP-5184](#).

#### 5.2 Working Alone

Hazards associated with some work assignments require the presence of two or more employees to ensure worker safety (e.g., permit-required confined space work, hotwork outside of a designated shop area, working in atmospheres requiring the use of a supplied breathing air system). When work assignments require the presence of two or more workers, the buddy system, as defined in 29 CFR 1910.120(a)(3), shall be employed:

**Buddy system** means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

The purpose of the buddy system in tank farms is to:

- Provide personnel with assistance, if needed
- Observe co-worker for signs of chemical or heat exposure
- Periodically check the integrity of a co-worker's PPE
- Notify the supervisor if help is needed.

Workers, when employing the buddy system, will be in the same work area, performing like duties, in the same level of personal protective equipment.

[TFC-ESHQ-S SAF-C-03](#) outlines the requirements and responsibilities for assigning employees to work alone.

### 5.3 Communication

Communications are essential to all smoothly run operations. Personnel should be provided with the appropriate equipment to facilitate the transmission of information necessary to support work activities, report emergencies, and receive emergency information. This does not require that each person be in possession of a transmitting or receiving device, but that such instruments are accessible to workers within the assigned work area. Information can be received by one person and given to other individuals by any recognized direct means. The primary means for communicating to and from the field is by use of radios and cellular phones.

[TFC-OPS-OPER-C-31](#) provides specific guidance for routine and emergency communications through the use of the crash alarm, siren, alarm, and general plant telephone systems.

## 6.0 CONTAMINATION CONTROL

Contaminants may be present in the form of solids, liquids, gases, or vapors. Dust and dirt contaminated with radionuclides, toxic organic compounds, or metals may collect on the surface of personal protective equipment or in cracks, crevices, folds, and seams. The purpose of contamination control is to protect site personnel by minimizing the transfer of harmful materials into clean areas, help prevent mixing of incompatible chemicals, and protect the community by preventing uncontrolled transportation of contaminants from the site. Requirements for setup, operating in, and exiting from, radiological buffer areas, contamination areas, high contamination areas, airborne radioactivity areas, and soil contamination areas are provided in

[TFC-ESHQ-RP MON-C-14](#).

### 6.1 Minimizing Contamination

Contamination is minimized by engineering controls (e.g., containment at the source), administrative controls (e.g., establishing control area boundaries), and personal protective equipment. [HNF-5183](#) provides guidance on application of controls to maintain exposures ALARA, including: engineering controls, administrative controls, proper use of personal protective equipment (donning and doffing), work conduct and practices, and monitoring for personnel contamination. Contamination controls considerations are also discussed in [TFC-ESHQ-RP RWP-C-03](#) and [TFC-ESHQ-RP RWP-C-02](#).

### 6.2 Decontamination

Decontamination is the process of removing or neutralizing contaminants that have accumulated on personnel and equipment. Decontamination protects workers from contact with hazardous substances that may contaminate and eventually permeate protective clothing, respiratory equipment, tools, vehicles, and other equipment used on site. Procedures defining decontamination requirements include [TF-AOP-011](#), [TFC-ESHQ-RP MON-P-04](#), and [TFC-ESHQ-RP MON-P-03](#).

Mobile self-contained decontamination units have been provided to aid in emergency chemical/radiological/mixed waste decontamination events. One unit is staged at the 242-S

Evaporator in the 200 West Area, and another unit is centrally located in the 200 East Area. These units can be relocated to a job site based on hazards identified during the job hazard analysis.

### 6.3 Release Surveys for Material and Equipment

Release surveys are required before releasing material and equipment from radiological areas established for contamination control (radiological buffer area, contamination area, high contamination area, soil contamination area, and airborne radioactivity area).

[TFC-ESHQ-RP MON-C-23](#) provides the methods for performing and documenting radiological release surveys and guidance for developing release survey plans.

### 6.4 Radiologically Controlled Vehicles

When vehicles are taken into soil contamination, contamination, high contamination, or airborne radioactivity areas, they must be controlled as radioactive material or be released unconditionally from radiological controls. [TFC-ESHQ-RP MON-C-19](#) provides administrative controls for the operation of radiologically controlled vehicles, including survey methods and controls commensurate with the potential for contamination.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is used to shield or isolate individuals from the chemical, physical, biological, and radiological hazards that may be encountered at the tank farms. The use of personal protective equipment to mitigate a hazard should be chosen only after a determination that engineered safeguards and/or administrative controls do not provide adequate protection. Requirements for the selection of appropriate personal protective equipment for each task or activity are found in [TFC-ESHQ-S IS-C-02](#). The specific personal protective equipment requirements will vary, depending on the nature of the work being performed and the area of the tank farms where the task is taking place. Requirements for personal protective equipment are itemized or noted in work control documentation, Job Hazard Analyses, and/or Radiological Work Permits, as applicable, and requirements discussed with workers during pre-job briefings.

## 8.0 INDUSTRIAL HYGIENE MONITORING

Industrial hygiene monitoring is conducted to assess potential and estimated exposure of people to industrial hygiene hazards. Monitoring can be conducted for a range of chemical and physical hazards using a variety of sampling methods. The hazards to be monitored and methods to be used at the Hanford tank farms can be found in the Exposure Assessment Strategy (EAS), [TFC-PLN-34](#).

The EAS, this HASP, and the monitoring requirements will be reviewed and updated at least annually. This review will consider any new toxicological data, carcinogenicity ranking, sample results, occupational exposure level changes during the year, and any other changes as requested by the Director, [Environmental Safety & Health](#).

## 8.1 Types of Monitoring Activities

### 8.1.1 Personal Exposure Monitoring

Personal monitoring is the primary and preferred method of personnel exposure monitoring and is conducted to estimate the unprotected potential exposure of people to industrial hygiene hazards. This is typically done by sampling from the breathing zone of a person for respiratory hazards or by sampling from the auditory zone for hearing hazards. This monitoring is conducted in accordance with [TFC-ESHQ-S\\_IH-P-09](#).

### 8.1.2 Area Monitoring Related to Personal Exposure

Area monitoring is sampling the work environment at a fixed geographic point. It is conducted to determine the potential unprotected exposure to an industrial hygiene hazard at that location. It is also performed to confirm modeling that describes potential personnel exposure at that point. This monitoring is conducted in accordance with [TFC-ESHQ-S\\_IH-P-09](#).

### 8.1.3 Source Monitoring

Source monitoring is a special case of area monitoring conducted to determine the potential unprotected exposure of people to industrial hygiene hazards. This is typically done by sampling at the immediate point at which a hazard enters the work environment.

### 8.1.4 Tank Headspace Grab Sampling

Headspace monitoring is a special case of source monitoring conducted by drawing the sample from the tank headspace. It is typically conducted to identify and quantify levels of volatile and semi-volatile contaminants in the headspace of a tank. Qualitative information can be used to enhance process hazard understanding or to characterize tank contents.

### 8.1.5 Screening

Work activity screening or surveying is generally done using direct reading instruments to assess the actual work environment on a real time basis. The need for such screening is determined during the Job Hazard Analysis and is done to ensure no appreciable change has occurred since the last prior monitoring or screening was conducted. Requirements for work activity screening are identified in ~~TFC-ESHQ-S\_IH-CD-35~~ [TFC-ESHQ-S\\_IH-C-48](#).

## 8.2 Monitoring Strategy

The nature of the tank farm work site, like other hazardous waste operations, is frequently changing where variable exposure potentials may occur based on location and activities. Evaluation of these complex situations requires a sound, logical work place exposure assessment strategy to optimize industrial hygiene and other occupational health resources on those work situations with the greatest potential for adverse health effects. [TFC-PLN-34](#) provides the comprehensive strategy incorporating ALARA principles for conducting industrial hygiene exposure assessments. This procedure also describes the methods and rationale used to characterize and monitor workers' potential and estimated exposures to hazardous chemical, physical, ergonomic and biological agents.

Guidance for industrial hygiene monitoring and control strategies to be utilized during retrieval operations such as salt well pumping, salt cake dissolution, vacuum retrieval, modified sluicing, tank-to-tank transfers, acid or caustic additions, and evaporator campaigns is provided in [TFC-ESHQ-IH-STD-12](#).

### 8.3 Exposure Monitoring, Reporting, and Records Management

[TFC-ESHQ-IH-STD-03](#) defines the requirements that industrial hygienists, industrial hygiene technicians, and other sampling personnel shall follow related to exposure monitoring. It addresses communicating validated industrial hygiene monitoring results to line management, employees, and occupational medicine; using standardized data collection forms to ensure that all required information is obtained for a complete exposure record in accordance with the OSHA recordkeeping requirements defined in [29 CFR 1910.1020](#) and [29 CFR 1910](#), Subpart Z, substance specific standards; transmittal of completed industrial hygiene monitoring records to the Tank Farm Industrial Hygiene Programs records coordinator; and transmittal of industrial hygiene records to the Hanford Industrial Hygiene Programs records coordinator for archival.

## 9.0 MEDICAL SURVEILLANCE

[TFC-ESHQ-S IH-C-17](#) defines the process for determining and obtaining necessary employee medical qualifications and monitoring based on the job requirements, hazards, exposures, and overall risk associated with their assigned work scope. This program also directs the use of an automated Employee Job Task Analysis (EJTA) which supports the collection of the data necessary for a risk-based approach to medical qualification and monitoring. The information collected on the EJTA represents a compilation of hazards and exposures associated with routine work activities, as well as hazards associated with non-routine work activities that can be predicted or anticipated. Hazard and exposure information for non-routine activities that cannot be predicted or anticipated are identified through job hazard analysis, job safety analysis, automated job hazard analysis, or comparable processes.

Implementation of this program facilitates compliance with [DOE 440.1A](#), which requires employee job task and hazard analysis information be provided to the medical contractor. In addition, this program facilitates compliance with various OSHA standards found in 29 CFR 1910 and 1926, and other regulations that either require medical qualification examinations or medical monitoring when specific activities are being performed or when specified hazards and exposures are encountered. In order for the medical surveillance program to be effective, employee monitoring results will be provided to the medical contractor.

The medical contractor is responsible for scheduling employees and the employees of contractors, and lower-tier subcontractors for medical qualification examinations and medical monitoring based on the data provided through the EJTA. Results of medical examinations and monitoring are reported to employees, employees of contractors and lower-tier subcontractors, and their respective managers or supervisors. The medical contractor is responsible for maintaining medical records in accordance with the applicable OSHA and DOE requirements.

## 10.0 INJURY REPORTING AND RESPONSE

[TFC-ESHQ-S CMLI-C-02](#) provides direction for reporting, investigating, and managing injuries, illnesses, or accidents. This procedure also establishes requirements to ensure that prompt medical treatment by qualified first aid providers is obtained in accordance with OSHA requirements. The requirements include initial response to reporting, investigating, and managing

occupational and non-occupational injuries and illnesses, chemical exposures, and injuries due to government motor vehicle accidents and incidents. All injuries, no matter how minor, must be reported to management.

As mentioned in Section 4.2.2, [TF-AOP-015](#) identifies the actions required for response to notification from personnel that vapor odors are present.

## **11.0 EMERGENCY MANAGEMENT**

The emergency management program ensures that emergency events are responded to in a manner that protects the health and safety of employees, the public, and the environment. The tank farms emergency management process is described in [TFC-OPS-EP-C-01](#).

The Hanford Site Emergency Preparedness Program is based upon the incident command system, which allows a graded approach for response to emergency events. HNF-IP-0263-TF describes the facility hazards, emergency planning, and basic responses to upset and/or emergency conditions within the tank farms; and provides reference to tank farms emergency response procedures and abnormal operating procedures. It is used in conjunction with DOE/RL-94-02.

## **12.0 ENVIRONMENTAL PROTECTION AND RESPONSE**

Because of the hazardous nature of many materials used and found in the tank farms, only trained personnel can respond to a hazardous material or hazardous waste spill. It is the responsibility of the employee identifying the spill to immediately notify the shift manager in the event of a release to the environment or if unexpected contaminated spills are encountered at the tank farms. The requirements for response to a spill of hazardous material or waste are described in [TF-AOP-011](#) and HNF-IP-0263-TF. The requirements for notifying state or other regulatory agencies are included in [TFC-ESHQ-ENV\\_FS-C-01](#).

## **13.0 HAZARD COMMUNICATION**

The purpose of the Tank Farm Hazard Communication Program is to communicate to tank farm workers the potential for illnesses and injuries related to the work environment. The program requires managers to inform their workers of the hazards in the work area and how they can protect themselves. [TFC-ESHQ-S\\_IH-C-02](#) describes the processes that are used to communicate hazard material information to all personnel who work with hazardous materials during any activity in the tank farms, and identifies the location of right-to-know stations and chemical storage areas.

## **14.0 TRAINING**

[TFC-PLN-61](#) describes the training management system that is used to define the activities necessary to meet the technical, organizational, and professional development training requirements.

Employees are provided training to comply with OSHA Hazard Communication training requirements. Depending on employee job duties, this training may include Hanford General Employee Training, Tank Farm Orientation, Facility Emergency/Hazard Identification Checklist, 24-Hour Hazardous Waste Worker Training, and/or 40-Hour Hazardous Waste Worker Training.

Individual personnel training requirements and status are managed on the Integrated Training Electronic Matrix (ITEM) database system. The responsibilities and guidelines for interfacing with the ITEM database system are described in [TFC-BSM-TQ\\_MGT-C-02](#).

#### 14.1 Dangerous Waste Training

[TFC-PLN-07](#) outlines the introductory and continuing training programs designed to prepare employees to operate and maintain the tank farms in a safe, effective, efficient, and environmentally sound manner, and to ensure that employees are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. This plan identifies training requirements for four categories of workers: all employees, waste workers, advanced waste worker, and waste worker supervisor/manager.

#### 14.2 Chemical Hazards Awareness Training

A chemical hazards awareness training course was developed to provide tank farm workers with a better understanding of the risks and hazards associated with chemical vapors emanating from the underground waste storage tanks. The training will be mandatory for unescorted tank farm access and covers chemical content of the tanks, how the tanks are monitored, hazards associated with the chemicals, health symptoms and effects of exposure, and engineering/administrative controls in place to protect workers.

#### 14.3 Training Records

[TFC-BSM-TQ\\_MGT-C-04](#) describes the methods for maintaining training records.

### 15.0 SOURCES

#### 15.1 Requirements

1. 10 CFR 851, "Worker Safety and Health Program."
2. [29 CFR 1910.120](#), "Hazardous Waste Operations and Emergency Response." (S/RID)
3. 29 CFR 1926.26, "Illumination."
4. 29 CFR 1926.56, "Illumination."
5. RPP-MP-003, "Integrated Environment, Safety and Health Management System Description for the Tank Farm Contractor."

#### 15.2 References

1. [29 CFR 1910.1020](#), "Access to Exposure and Medical Records."
2. DOE/RL-92-36, "Hanford Site Hoisting and Rigging Manual (DOE-RL 1993)."
3. DOE/RL-94-02, "Hanford Emergency Management Plan."
4. HNF-5183, "Tank Farms Radiological Control Manual (TFRCM)."

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5. HNF-MP-5184, "Radiation Protection Program."
6. HNF-IP-0263-TF, "Building Emergency Plan for Tank Farms."
7. HNF-IP-1266, "Tank Farms Operations Administrative Controls."
8. HNF-SD-WM-TSR-006, "Tank Farms Technical Safety Requirements."
9. NIOSH/OSHA/USCG/EPA Publication, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities."
10. OSHA Voluntary Protection Program.
11. RPP-13033, "Tank Farms Documented Safety Analysis for Tank Farms."
12. RPP-MP-003, "Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor."
13. RPP-22491, "Industrial Hygiene Technical Basis."
14. TF-AOP-004, "Response to Seismic Event."
15. TF-AOP-007, "Response to Hanford Site Range Fire."
16. TF-AOP-008, "Response to High Winds and Dust Storms."
17. TF-AOP-010, "Response to Flooding Conditions."
18. TF-AOP-011, "Response to Radiological/Hazardous Material Leaks, Spills and/or Personnel Contamination."
19. TF-AOP-013, "Response to Volcanic Ash Fall and Snow Fall."
20. TF-AOP-014, "Response to Lightning."
21. TF-AOP-015, "Response to Reported Odors or Unexpected Changes to Vapor Conditions."
22. TFC-BSM-TQ\_MGT-C-02, "Integrated Training Electronic Matrix (ITEM) Administration."
23. TFC-BSM-TQ\_MGT-C-04, "Training Records Administration."
24. TFC-ENG-FAC SUP-C-25, "CH2M HILL Hoisting and Rigging."
25. TFC-ESHQ-ENV\_FS-C-01, "Environmental Notification."
26. TFC-ESHQ-FP-C-01, "Controls for Safe Hotwork."
27. TFC-ESHQ-FP-STD-03, "Flammable/Combustible Liquids."

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28. TFC-ESHQ-IH-STD-01, "Cold Stress."
29. TFC-ESHQ-IH-STD-03, "Exposure Monitoring, Reporting, and Records Management."
30. TFC-ESHQ-IH-STD-04, "Asbestos Control - Facility Management/General Industry."
31. TFC-ESHQ-IH-STD-05, "Asbestos Control - Construction Industry."
32. TFC-ESHQ-IH-STD-06, "Hearing Conservation Program."
33. TFC-ESHQ-IH-STD-08, "Lead Control Program."
34. TFC-ESHQ-RP\_ADM-C-15, "Entry and Exit Controls."
35. TFC-ESHQ-RP\_MON-C-14, "Contamination Area Controls."
36. TFC-ESHQ-RP\_MON-C-19, "Radiologically Controlled Vehicles."
37. TFC-ESHQ-RP\_MON-C-23, "Release Surveys for Material and Equipment."
38. TFC-ESHQ-RP\_MON-P-03, "Personnel Decontamination."
39. TFC-ESHQ-RP\_MON-P-04, "Personal Effects Decontamination."
40. TFC-ESHQ-RP\_RWP-C-02, "Radiological Containment."
41. TFC-ESHQ-RP\_RWP-C-03, "ALARA Work Planning."
42. TFC-ESHQ-RP\_RWP-C-04, "Radiological Work Permits."
43. TFC-ESHQ-S\_CMLI-C-02, "Injury and Illness Events."
44. TFC-ESHQ-S\_IH-C-02, "Hazard Communication."
45. TFC-ESHQ-S\_IH-C-04, "Permit Required Confined Space."
46. TFC-ESHQ-S\_IH-C-05, "Respiratory Protection."
47. TFC-ESHQ-S\_IH-C-07, "Heat Stress Control."
48. ~~TFC-ESHQ-S\_IH-CD-35~~ [TFC-ESHQ-S\\_IH-C-48](#), "Managing Vapor Control Zones."
49. TFC-ESHQ-S\_IH-P-09, "Industrial Hygiene Personal/Area Exposure Monitoring."
50. TFC-ESHQ-S\_IH-STD-03, "Ergonomics."
51. TFC-ESHQ-S\_IS-C-01, "Scaffolding."
52. TFC-ESHQ-S\_IS-C-02, "Personal Protective Equipment."
53. TFC-ESHQ-S\_IS-C-03, "Excavating, Trenching, and Shoring."

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54. TFC-ESHQ-S\_IS-C-07, "Powered Industrial Trucks."
55. TFC-ESHQ-S\_SAF-C-03, "Control of Working Hours and Working Alone."
56. TFC-ESHQ-S\_SAF-C-04, "Stop Work Responsibility."
57. TFC-ESHQ-S-STD-01, "Portable Ladders."
58. TFC-ESHQ-S-STD-02, "Transportation Safety."
59. TFC-ESHQ-S-STD-03, "Electrical Safety."
60. TFC-ESHQ-S-STD-05, "Walking/Working Surfaces."
61. TFC-ESHQ-S-STD-11, "Office Safety."
62. TFC-ESHQ-S-STD-12, "Elevating Work Platforms."
63. TFC-ESHQ-S-STD-13, "Hand and Portable Power Tools."
64. TFC-ESHQ-S-STD-19, "Safety Showers and Eyewash Stations."
65. TFC-ESHQ-S-STD-21, "Machine Guarding."
66. TFC-ESHQ-S-STD-24, "Bloodborne Pathogen Exposure Control Standard."
67. TFC-ESHQ-S-STD-25, "Storing, Using, Handling, and Transporting Compressed and Liquefied Gases."
68. TFC-ESHQ-S-STD-26, "Fall Protection."
69. TFC-OPS-EP-C-01, "Emergency Management."
70. TFC-OPS-MAINT-C-01, "Tank Farm Contractor Work Control."
71. TFC-OPS-OPER-C-04, "Access and Key Control for Tank Farm Facilities."
72. TFC-OPS-OPER-C-05, "Lockout/Tagout Program."
73. TFC-OPS-OPER-C-10, "Vehicle and Dome Load Control in Tank Farm Facilities."
74. TFC-OPS-OPER-C-31, "Communication Guidelines."
75. TFC-PLN-07, "Dangerous Waste Training Plan."
76. TFC-PLN-24, "Chronic Beryllium Disease Prevention Program Plan."
77. TFC-PLN-34, "Industrial Hygiene Exposure Assessment Strategy."
78. TFC-PLN-61, "Tank Farm Contractor Training and Qualification Program."